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ABSTRACT

This publication of the Biological Sciences Curriculum Study (BSCS) presents an updated report on "Me in the Future," a curriculum development project that started in 1975 for educable mentally handicapped (EMH) students of secondary school age. The report introduces the project and describes its stages of development. The evaluation of the project is being carried out as a multi-phase field-testing and revision of experimental materials. A materials kit and a few sample activities from the project are presented. (GA)

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THE BIOLOGICAL SCIENCES CURRICULUM STUDY

BSCS NEWSLETTER 69 JOURNAL

U.S. DEPARTMENT OF HEALTH, EDUCATION & WELFARE
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A Progress Report on ME IN THE FUTURE
A BSCS Science Program for Special Education and Career Awareness

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BSCS NEWSLETTER

THE BIOLOGICAL SCIENCES CURRICULUM STUDY
JOURNAL

BIOLOGICAL SCIENCES CURRICULUM STUDY

NEWSLETTER TO JOURNAL—A TWENTIETH-ANNIVERSARY TRANSITION

Anniversaries signify mileposts in time for both individuals and organizations. The year 1978 will mark twenty years of service to the educational and scientific communities on the part of the Biological Sciences Curriculum Study. BSCS dates from 1958, when the NSF made an initial grant of $143,000 to the American Institute of Biological Sciences for the establishment of the Biological Sciences Curriculum Study.

While the passage of twenty years may have some significance, it is the contributions of an organization that provide a rationale for its existence. Organizations, like organisms, have varying periods of productivity, but sliding into senescence and extinction can be avoided by continued activity and contribution. Organismal divisions into fresh, new entities similar to the fission of a single cell retain the viability of the strain. So, in organizations, viability is maintained by continuing needs assessments and the institution of new programs meeting uncovered needs.

During the twentieth anniversary of BSCS we will be reviewing past accomplishments and future directions: We will be tracing the BSCS from an organization essentially concerned with changing the face of secondary school biology to one with programs that now extend from kindergarten to college—programs that encompass a broad range of student abilities, from the mentally handicapped to the prospective professional scientist; programs that extend from print and laboratory materials to a wide range of media, including games, models, slides, films, and audio tapes.

Even the name *Biological Sciences Curriculum Study* may no longer be appropriate when one considers our involvement with the social and physical sciences, behavior, and such skills as reading and mathematics. However, the name is widely known and firmly established, so we prefer to retain it; we interpret the word "biological" in our name in its broadest sense, as an adjective that refers to living systems and the things that impinge upon them.

One name change that will be initiated in 1978, however, is a change in the name of this publication from the BSCS Newsletter to the BSCS Journal. The change will more properly reflect the present status of the publication. Initially, the BSCS Newsletter was exactly that—a newsletter. The first issue appeared in September of 1959. It was designed to keep the biological community, educators, administrators, and other interested persons informed of the plans and progress of the Biological Sciences Curriculum Study. Through its first twenty-nine issues, the BSCS Newsletter continued

CONTENTS

Introducing ME IN THE FUTURE 2*

The Development and Evaluation of the Project 3*

The Future of ME IN THE FUTURE 11*

The Materials Kit 12*

Sample Activities from ME IN THE FUTURE 13*

News & Notes 23

A New Edition of the Biology Teachers' Handbook to be Available in March 26

*These articles were prepared by the project staff of ME IN THE FUTURE:

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to grow and broaden its coverage so that it not only reported on the events transpiring at the Biological Sciences Curriculum Study, but began to provide insightful pieces on a great variety of topics and concepts relative to biological education and curriculum development. By Newsletter 30 in January of 1967, the publication not only began to deal in depth with specific areas such as evaluation, international activities, and teacher preparation, for example, but also became a quarterly, appearing at specific and announced times during the academic year. Initially, the Newsletter was sent to a small coterie of individuals, mostly those who had been involved with the version testing. By the late sixties, the Newsletter mailing list contained over 40,000 names, and the expense of preparing, printing, and mailing became excessive. Two measures were introduced at that time to reduce costs: One was the purging of the mailing list by requesting those individuals wishing to continue to receive the Newsletter to return a postcard; second, beginning with Newsletter 36 for September 1969, the acceptance of advertising to help defray costs.

By mid-1977 the BSCS was printing and distributing, free of charge, four Newsletters a year to a mailing list in excess of 20,000 persons. The design and format of the Newsletter, frequently using four colors in the printing process, is equal in quality to many subscription journals. It is a tribute to the Newsletter content that many libraries, contrary to their normal policies on newsletters, stock the BSCS Newsletter on their shelves. Also, many research papers cite the Newsletter as their source of data.

It became increasingly apparent over the last few years that the "newsletter" designation was no longer appropriate for the quality and content of the materials contained within this BSCS publication. The BSCS Board of Directors, at its November 1977 meeting, in consideration of the contribution of the Newsletter to biological education, elected to change its name from the BSCS Newsletter to the BSCS Journal, the title finally approved by the BSCS Executive Committee.

This then is a hail and farewell. Farewell to sixty-nine issues of the BSCS Newsletter dating from September 1959 through November of 1977. Eighteen years of Newsletters will terminate with this issue, and in 1978 the first issue of the BSCS Journal, Vol. I, No. 1, will mark the twentieth year of BSCS existence. The concerns of the BSCS Journal will continue those initiated by the Newsletter. It will be designed to inform interested persons concerning the activities of BSCS. It will contain articles dealing with research, development, and dissemination of BSCS materials, and articles that deal with curriculum development in the broadest sense. Manuscripts are solicited on those topics and will be published as editorial decisions and space permit. The Journal will continue to be distributed free to those who will profit from its receipt. The deficits incurred in the production and distribution of the Journal will be absorbed by the BSCS as part of its mission to improve biological education, as interpreted in its broadest sense at all levels. We will continue to solicit reader comment and suggestions of how the BSCS Journal may continue to further educational improvement.

INTRODUCING ME IN THE FUTURE

ME IN THE FUTURE represents the culmination of a planned series of life science curricula designed specifically for use by educable mentally handicapped students. It incorporates and builds upon the concepts used as a basis for the development of ME NOW and ME AND MY ENVIRONMENT.

To get an overall view of the basic framework of ME IN THE FUTURE, it is in order to look back at the development of ME NOW, the first BSCS program for the educable mentally handicapped (EMH), and ME AND MY ENVIRONMENT, the second such curricular program. ME IN THE FUTURE is based and expands upon many of the general objectives and basic assumptions underlying the design of the two earlier instructional programs.

When work on the program first began in 1968, meetings were held with special education teachers throughout the United States. In addition, an advisory board consisting of knowledgeable practitioners in the fields of special education and biology met with the BSCS staff for the purposes of identifying the needs and learning problems of the target population. Out of the meetings came a set of basic assumptions underlying the design of the projected curriculum materials and a set of general objectives to guide in their development. As each of the programs evolved, various aspects of the basic assumptions and general objectives that had been established were modified slightly to meet the requirements of each new curriculum project. The overall principles contained within the basic assumptions and general objectives remained, however, and continued to serve as guidelines for the development of life science curriculum materials for use by educable mentally handicapped pupils.

It was postulated by the advisory board and the BSCS project staff that the ages of eleven to thirteen represent a period in the development of children when they need to understand and accept their own bodies and how their bodies function. ME NOW was established as the vehicle whereby a sequence of biological information about the structure and function of the human body could be presented to that population of students in a simplified, linear manner.

ME NOW emerged as a distinct departure from most special education curricula. Basic to its development was one of the BSCS tenets which suggested that instruction should encourage pupils to become directly involved in investigations, rather than to read about them or to listen to the teacher tell about them. As an implementation of that idea, the pupils were presented with a series of activities that were carefully programmed for their direct involvement. There was no student textbook.

Further, the program included a planned redundancy that used a variety of media and appealed to more than one of the students' senses. For example, the heartbeat was *heard* through a stethoscope, *felt* through the pulse in a number of places on the body, and *seen* in the vessels of a rabbit's ear. The principal form of presentation was not typically a lecture by the teacher, but rather an activity that encouraged pupil discussion and expression through a carefully tested sequence of questions.

Since few special education teachers had fulfilled more than the minimum requirements in science education during their preparation for teaching, the concept of a teaching kit was introduced. The teaching kit provided suggestions that not only assisted the teacher in determining what to do and how to do it, but also provided the actual materials necessary to carry out those suggestions in the classroom.

ME NOW, upon completion, was successfully field-tested in a wide variety of EMH classes. The program is now released by the BSCS and is published and produced by Hubbard Scientific Company. It enjoys a growing acceptance by the special education community throughout the United States.

Many of the features of ME NOW proved successful as a curricular approach for use with older educable mentally handicapped pupils. Those features were carried over into the development of a BSCS program for EMH children of junior high school age. The focus of that program was directed toward environmental studies. It suggested ways that a study of the environment could meet the needs of EMH children thirteen to sixteen years of age. Following the style of its predecessor, the new program came to be known as ME AND MY ENVIRONMENT.

Several considerations played an important part in the development of ME AND MY ENVIRONMENT. Included were the basic assumptions about the population of pupils and the nature of the materials needed for that population, as first developed for ME NOW. Also introduced into the program framework were the environmental themes and developmental tasks, ideas and concepts that form the scientific content of the materials. In addition, the processes and skills considered important for the population were delineated; these included the inquiry and problem-solving skills. Again, the BSCS experience dictated that the framework for development include a means for group and individual activities to assure pupil participation. Other elements of the design include a concern for communicating a sense of direction and purpose in the activities, and for utilizing a number of different media in providing a variety of approaches to learning.

ME AND MY ENVIRONMENT, as with ME NOW, underwent exhaustive field-testing and extensive revision on the basis of recommendations by the field-test teachers and other data obtained from test site evaluation procedures. The revisions were accomplished by teams of special education and biology teachers. This sequence of development, trial, revision, retrial, and final revision continued until the materials were released for publication and general distribution. Like ME NOW, ME AND MY ENVIRONMENT is gaining widespread acceptance and use as a life science curriculum for educable mentally handicapped students of junior high school age.

ME IN THE FUTURE has followed the same plan in its development. It provides sixteen- to nineteen-year-old EMH students with opportunities to continue expanding their awareness of science, but now in a career education framework. The program is designed to meet the needs of an older population of students whose focus at this stage in their development is shifting to career interests.

The Development and Evaluation of the Project

The four-year curriculum development project called ME IN THE FUTURE, which had its conceptual beginnings in the summer of 1975, is presently entering its third phase of field-testing and revision of the experimental materials. The project is funded by the Bureau of Education for the Handicapped, United States Office of Education. It is designed to produce and evaluate model science materials in a curriculum of career education for educable mentally handicapped (EMH) students of secondary school age.

The development of a conceptual framework, and the definition of and research into the key factors of critical thought and independent action, were the primary objectives of the advisory committee, who served to assist the staff in the formulation of a conceptual model for the overall development of the curriculum. Agreement was reached on the definition of terms and an understanding of the major concepts involved in the curriculum, as well as on what constraints were to be observed in producing it. In the first phase of the project came the preparation and field-testing of a pilot module.

The Pilot Module

The first task after developing a conceptual model for ME IN THE FUTURE was to prepare a set of pilot materials. Those materials and the pilot test itself were designed to serve primarily two purposes in the development of the program:

1. To test the viability of the conceptual model, which was designed to combine concepts from science, special education, and career education.
2. To determine the validity of the basic assumptions about the target population and whether those assumptions could actually form the basis for the design of student activities in a variety of content areas, and in four different delivery systems (i.e., self-contained classroom, work-study program, resource room, and "mainstream" situation).

The development of the pilot materials was accomplished by bringing together a group of special educators and science educators for a small writing conference. Those writers, together with the project staff, produced a set of sample materials for ME IN THE FUTURE. There were, besides an introduction to science and careers, twenty science activities bracketed by pre-activities and post-activities designed to provide a career emphasis. The activities were divided into three groups—vocations, leisure, and daily living skills. Representing each of those three groups was a sample cluster in each of the areas of construction, crafts, and personal hygiene. Content was decided upon and activities were written in accordance with the guidelines established in a set of basic assumptions. The materials for the students were designed to be used in an individualized audio-tutorial method so that students could listen to tape recordings as they read the written materials, without help from teachers or others.

The pilot materials were field-tested in three different high schools and a ninth-grade class housed in a junior high school, all in the metropolitan Denver area; each represented one of the four delivery systems that would be used in the field test of the program. Those systems consisted of the work-study situation, where students are in on-the-job training during part of the school day; the self-contained classroom, where the EMH students are all located in one homogeneously grouped classroom; the resource room, where the students are given special or additional help; and the mainstream situation, where the EMH student spends the majority of the day in heterogeneous classrooms with normal students. Socioeconomic levels varied, as did the ethnic backgrounds. The composition of the pilot-test classes is summarized in Table 1.

Information on the project was gathered through the use of three questionnaires developed to obtain feedback from teachers, students, and observers; and student worksheets used to evaluate student performance. Analysis of the results of the pilot-testing (Figure 1) revealed that at least

Table 1. ME IN THE FUTURE pilot field test, student background information: Year 1 (as of May, 1976).

Teacher	N	SEX		AGE RANGE						I Q. RANGE					Mean I Q	ETHNIC COMPOSITION		
		M	F	14	15	16	17	18	18+	50 or below	51 to 60	61 to 70	71 to 80	81 or above		White	Black	Chicano
01*	12	6	6	0	3	4	3	2	0	0	0	3	7	2	74	6	3	3
02*	14	11	3	0	2	4	6	1	1	0	0	1	6	6	77	14	0	0
03	9	6	3	0	1	3	3	1	1	0	1	2	5	1	71	7	0	2
04*	18	11	7	6	9	3	0	0	0	Mainstream Delivery System					--	14	0	4

*All I Q. information not available

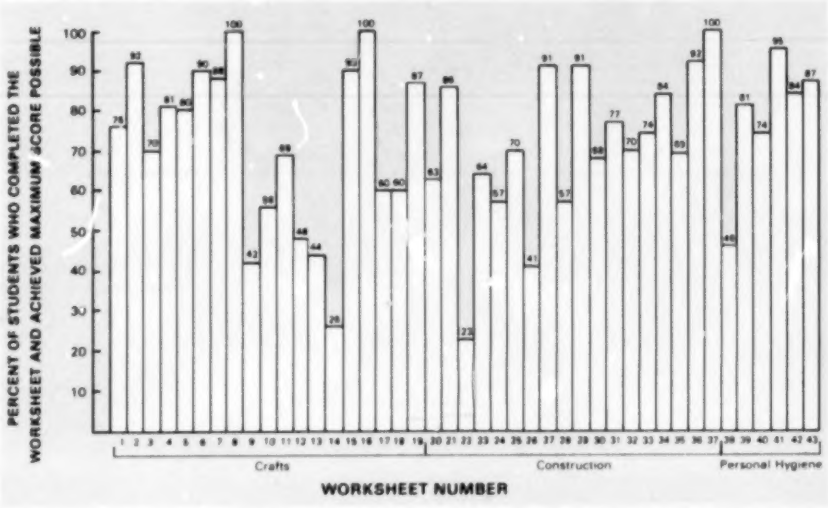


Figure 1. Percentage of students achieving the maximum possible score on each of the activity worksheets in the pilot test of the program.

50 percent of all students tested achieved the maximum possible score on 36 out of 43 worksheets. Based on those preliminary findings, the effort was considered successful. From feedback gathered from teachers, observers, and students during the testing of the pilot module, the following conclusions were drawn concerning the feasibility of ME IN THE FUTURE in its conceptual model:

1. Teacher and observer feedback indicated that it is possible to combine elements of special education, career education, and science education into a relevant and manageable set of activities that are both appropriate for and interesting to EMH students.
2. Student interviews and performance on the worksheets indicate that the basic assumptions are valid and that those assumptions can actually form the basis for the design of student activities in a variety of content areas and in four delivery systems.

Although information gained from the pilot test can be interpreted only in the broadest sense as a measure of the effectiveness of the program, it was an indication that the project was headed in the right direction. Incorporating information and experience gained from the pilot tests, drafts of the first experimental edition of the program were prepared at an extensive summer writing conference held during the summer of 1976; these were edited and revised by the staff of BSCS during the following fall.

THE FIRST EXPERIMENTAL EDITION OF ME IN THE FUTURE

The Design of the Program

The program was designed to integrate a knowledge of science, science process skills, and career education into a workable model. The student involved in ME IN THE FUTURE typically begins with both a limited interest and a limited awareness of the relationship of science to the career areas of vocation, leisure time activities, and daily living skills. As the student progresses through the program, both awareness and interest expand to a level commensurate with the student's ability. As the student moves toward completion of the program, interest focuses on specific areas within the student's expanded awareness. Such a process allows the individual students to select a life-style appropriate to their abilities, suited to their needs, and one that is not limited by a lack of exposure to alternatives.

The Activity Flow

The student enters the program through an introductory section, "Introduction to Science and Careers." This activity was designed to provide the student with an expanded understanding of the meaning of vocation, leisure, and daily living skills; additionally, it explores the relationship of those career areas to the science concepts required by a productive adult. The student selects clusters from each area that he or she believes would be interesting to investigate further, and records those selections on an Interest Inventory. After completing the introductory activity, each student follows an individually selected course through the program materials. The student selects one cluster from each of the three areas. Those three clusters comprise one student cycle.

It is possible for a student to repeat the exercise for selection of additional clusters as he or she progresses through the program. The flexibility of the program also allows for access by the students who are in work-study situations where specific needs arise. Science information is available for specific vocations, specific leisure activities, or special daily living skills. For example, a work-study student placed in the construction industry might be channeled directly into the Construction cluster without the need for going through the simulation exercise. Here, the science information needed is directly related to the work-study situation. Similarly, a student who expresses an interest in a particular daily living skill, or in a particular leisure activity, is channeled directly into that cluster.

A cluster is an area of concentration for student study and experimental activity. Each cluster is broken down into specific sets of activities. The sixteen clusters, along with the number of activities for each, that were field-tested in the first field test of ME IN THE FUTURE, are identified in Table 2.

After a student selects a cluster from each area, study begins. Each cluster is designed to channel students into the science content modules. For example, a student selecting the Construction cluster would be involved with such science activities as: Strength of Materials, Characteristics of Woods, and Characteristics of Metals. Each science activity is bracketed by a pre-activity that shows the importance of a particular science concept to a cluster (such as Construction), and a post-activity that relates the specific science content back to the cluster. Thus, the pre-activity introduces the topic, the activity explains the topic and provides a "hands-on" study of the material, and the post-activity recaps the important content of the activity.

Science activities can be accessed from the Science and Vocations area, the Science and Leisure activity area, or the Science and Daily Living Skills area, depending on student interest. For example, Construction and Crafts each has discrete pre-activities and post-activities, but shares the same science module (such as Strength of Materials). The student is required to investigate a sequence of science modules within the chosen cluster. Each cluster is comprised of a series of short science activities, each requiring approximately one hour of time.

Within each cluster, the sequence of activities is designed to build a related body of scientific knowledge and to develop inquiry skills, with an accent on career education. The conceptual model of the first experimental edition of ME IN THE FUTURE is illustrated in Figure 2.

Field-Test Site Selection

Twelve test sites were selected across the United States, representing a wide geographical distribution that included inner-city, urban, suburban, and rural locations. Additionally, the sites represented varied socioeconomic levels and ethnic backgrounds, and included both science and special education teachers using the program under four of the common delivery systems. The loss of one of the sites early in the testing phase was a result of circumstances beyond the control of the project. Consequently, data used in the analysis was based on eleven, rather than twelve, test sites. The location of

Table 2. ME IN THE FUTURE science clusters field-tested in 1976-77.

PROGRAM AREA	CLUSTER NAME	NUMBER OF ACTIVITIES
Vocation Clusters	Agri-Business and Natural Resources	10
	Construction	8
	Manufacturing	3
	Personal Services	4
	Public Services	4
	Transportation	4
Leisure Time Clusters	Crafts	11
	Games	7
	Sports	4
	Nature Activities	9
Daily Living Skills Clusters	Homes and Furnishings	9
	Self-Mobility and Communication	12
	Personal Hygiene	11
	Raising Children	9
	Food Management	12
	Clothing Management	9

those eleven test sites is shown in Figure 3. There were a total of 220 students in the eleven experimental classrooms: 121 males and 99 females with a mean age of 16.2 years. The composition of the student populations used in the field test is summarized in BSCS Newsletter 68, September, 1977, page 8.

Formative Evaluation Design and Procedures

The design and implementation of the first formative evaluation of ME IN THE FUTURE was directed towards the identification of potential weaknesses and problems, both in the implementation and mode of presentation of the program, and in the content of the individual activities and clusters of activities. Information on this dimension of the program was gathered through the use of four questionnaires developed to obtain feedback from teachers and observers, and worksheets, pretests, and posttests used to evaluate student performance.

Teachers were instructed to return completed evaluation forms, along with comments written on pages of the teacher's materials. It was felt that the written comments from teachers, as well as other staff reviewers, on all aspects of the interactions involved with each activity were an important part of formative evaluation and would serve as a valuable feedback source during revisions last summer. One evaluation form focused on a pre-instructional validation of the program content by the teachers before actual use of the program by the students. Judgments were made on the accuracy, relevancy, and appropriateness of each of the activities. Analysis of the teachers' feedback verified initial assumptions of the project regarding the learner characteristics and entering abilities that students in the target population possess. Second and third evaluation forms focused on post-instructional validation of the program after use in the classroom. Judgments related to the manageability and effectivenss of the component parts of the program were made and procedural problems identified. A fourth evaluation form, used during test site visits by the staff, focused on specific questions of how and with what success the program was implemented in the different schools. Information related to those questions is summarized in a table on pages 8 and 9 of BSCS Newsletter 68, September, 1977. This data, representing only a portion of the feedback from teachers, is an indication of their positive reaction to the program.

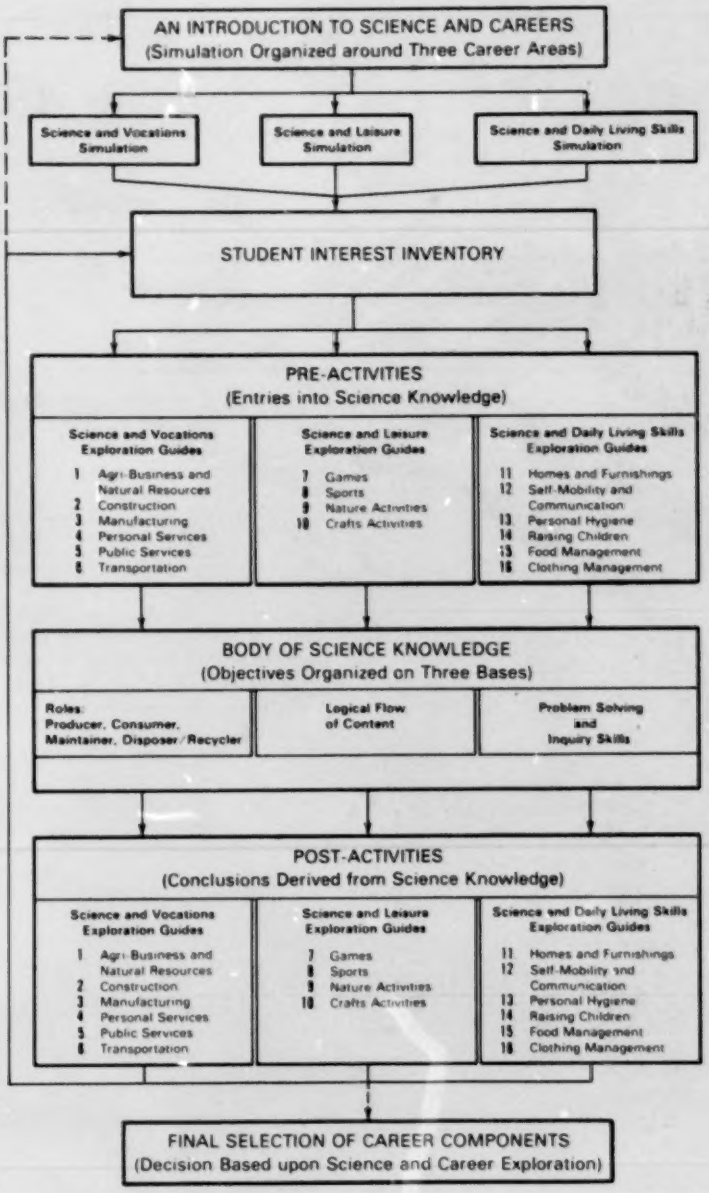


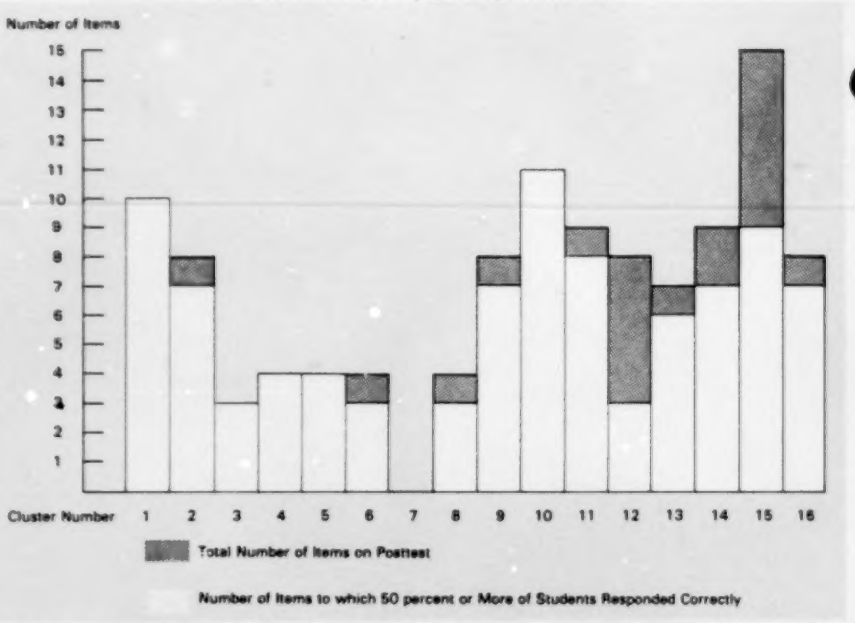
Figure 2. Conceptual model of ME IN THE FUTURE, first experimental edition 1976-77.

Table 3. Student background information, first field test.

Performance data from the worksheets were used to determine how well the students understood and were able to apply the information given in the activities. The pretests and posttests, administered before and after instruction in each of the sixteen clusters, focused both on the acquisition of content and on the students' abilities to function at a variety of levels of cognitive sophistication. The performance data were analyzed in terms of the specific information needed for the revision of individual activities. Because of the specificity of the data needed by the writers for revision purposes, it was not necessary to establish general performance trends (based on the experimental items) at that time. The content validity and construction of each of the experimental items used in the worksheets and cluster-level tests were also assessed through staff review and use of the computer item analysis program, Laboratory of Educational Research Test Analysis Package (LERTAP). Upon studying the point-biserial correlations and other analysis factors of the items, annotated item analyses were prepared for the writing teams to aid in pinpointing specific areas in the activities that were in need of revision. The items were analyzed for clarity and unwanted cues; each was examined to see if it related to the instruction, the instruction was examined to see if it related to the objective, and the objective itself was reexamined and reaffirmed. Based upon this inspection, the item was judged acceptable or unacceptable, the instruction adequate or inadequate, or the objective appropriate or inappropriate.

Because of time constraints involved in the collection and analysis of data, it was not always possible to obtain complete data from each of the clusters. For that reason, pretest data were determined to be unreliable and were not reported for this field test. However, a comparison of student performance on each of the 15 cluster-level posttests is shown in Table 3.

Table 3. Field Test I, posttest performance.



Performance results on the worksheet and posttest items indicated certain strengths as well as weaknesses in the experimental materials field-tested. However, those items represent only one means in evaluating the content dimension of the ME IN THE FUTURE program and should not be used as a summative evaluation of student learning. Those test items have been used for the first time. New item formats have been tried. Among the test items, some areas of the curriculum are not adequately represented. The validity and appropriateness of some of the items are still being investigated. Yet, in spite of the limitations and cautions noted, the data do provide a benchmark against which the results from further revisions can be measured. In the development of a major curriculum, the continuous gathering of information is essential to the production of a useful final product. The gathering of this information and the ongoing modification of materials based on the information is the essence of formative evaluation, and therefore, the major evaluative thrust of the ME IN THE FUTURE project. Revision of the First Experimental Edition of ME IN THE FUTURE (Summer Writing Conference, 1977)

Revision of the First Experimental Edition of ME IN THE FUTURE (Summer Writing Conference, 1977)

After completion of the first field test in June, summaries of the teacher and staff feedback, along with interpretations of student performance data on each of the individual activities, were prepared for use by the summer writers during revision of the first experimental materials at a summer writing conference. Sixteen writers met from June 13th to August 5th to produce the second experimental edition of ME IN THE FUTURE. The writing teams assembled for the writing conference were composed of classroom teachers from junior and senior high schools and learning centers, and science and special education theorists. The following persons served as writers during the development of the second experimental edition of ME IN THE FUTURE:

Elliott Asp	Leroy Martinez
Roy K. Baer	Mary Ellen May
James P. Barufaldi	George S. Mischio
Lowell J. Bethel	Floyd Ploeger
John Collins	William R. Reid
Diane K. Crider	Leslie Robson
Donald R. Daugs	Peter Sexton
Donna Jahnke	Gary Sigler

The writers, many of whom served as field-test teachers, worked in teams of two—a science educator and a special education educator. The writers, incorporating information and experience gained during the first field test of the materials made changes in the activities already developed and expanded the number of activities and clusters included in the science program. Each team of writers, after reviewing the feedback and performance data from the field test, formulated a revised cluster outline for the clusters for which they were responsible. After staff approved of the outline content, the team revised existing activities or wrote new ones, as indicated by cluster outlines. The first drafts were circulated to staff members for review and recommendation and then revised in a second, and then third draft. The third drafts were then reviewed and edited in preparation for the second field test in the fall.

The revision and development process used by the writers and staff may be analyzed by the use of a transformation model incorporating a storage unit. Such a system-design approach enables the curriculum

developers to identify resources, personnel, processes, and activities associated with specific stages of a curriculum development and to evaluate these in a formative fashion. A typical model used by the BSCS to describe and analyze curriculum development consists of twelve stages, as presented in Figure 4. This model represents a descending hierarchy of sequential stages related to producing curriculum materials. Stage 3, illustrated in Figure 5, provides a comprehensive view of the elements involved in formulating and writing the experimental curriculum. The revision of the first experimental edition of ME IN THE FUTURE followed a sequence similar to Stage 3, with the addition of the stored information regarding recommendations for curriculum change, as represented in Stage 7 (Figure 6).

The eighteen clusters around which the content of the revised program is built, along with the number of activities included in each, are identified in Table 4. Based on feedback from field-test teachers, recommendations were also provided to writers for needed changes in the introductory components of the program. The revised conceptual model illustrated in Figure 7 shows the modifications made in the original conceptual model of ME IN THE FUTURE. A slide program, incorporating most of the major ideas and concepts used to organize ME IN THE FUTURE is still being used as the introduction to the ME IN THE FUTURE program. A number of situations introduced in the program illustrate the concept of problem-solving as it is applied to each

Table 4. ME IN THE FUTURE science clusters to be field-tested in 1977-78.

PROGRAM AREA	CLUSTER NAME	NUMBER OF ACTIVITIES
Introduction	1 Metric	8
Science and Vocation	2 Agri-Business	13
	3 Natural Resources	12
	4 Construction	9
	5 Manufacturing	10
	6 Personal Services	9
	7 Public Services	9
	8 Transportation	6
Science and Leisure	9 Sports	9
	10 Nature	9
	11 Crafts	10
Science and Daily Living Skills	12 Homes and Furnishings	9
	13 Self-Mobility	9
	14 Communication	6
	15 Personal Hygiene	12
	16 Raising Children	10
	17 Food Management	11
	18 Clothing Management	7

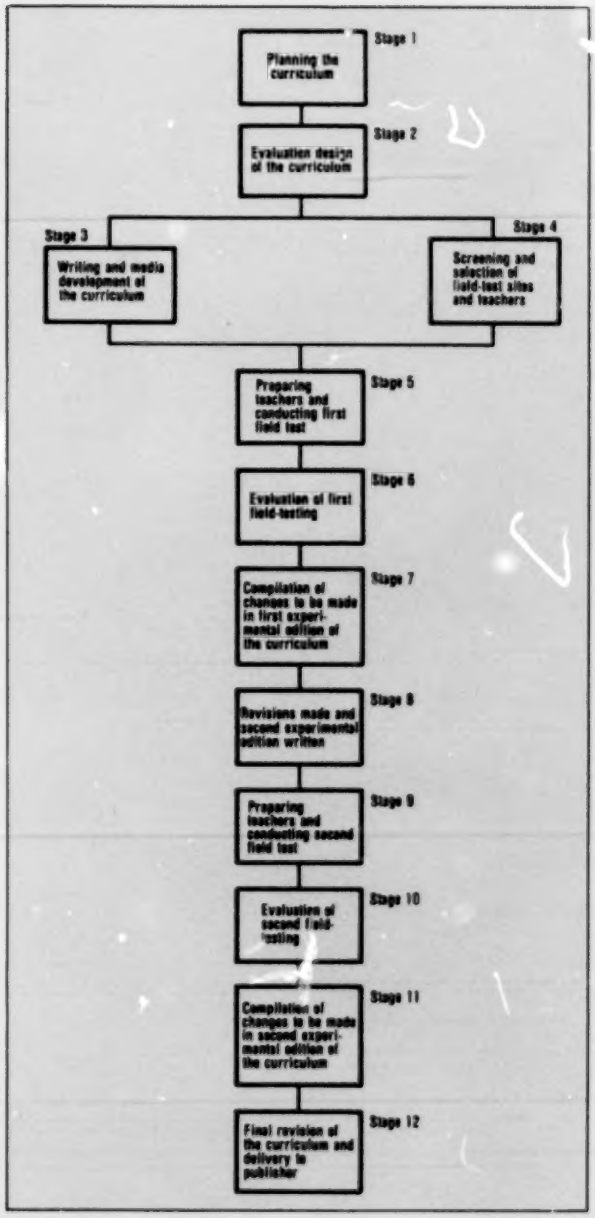

Stage 1
Planning the curriculum
Stage 2
Evaluation design of the curriculum
Stage 3
Writing and media development of the curriculum
Stage 4
Screening and selection of field-test sites and teachers
Stage 5
Preparing teachers and conducting first field test
Stage 6
Evaluation of first field-testing
Stage 7
Compilation of changes to be made in first experimental edition of the curriculum
Stage 8
Revisions made and second experimental edition written
Stage 9
Preparing teachers and conducting second field test
Stage 10
Evaluation of second field-testing
Stage 11
Compilation of changes to be made in second experimental edition of the curriculum
Stage 12
Final revision of the curriculum and delivery to publisher

Figure 4. Stages of curriculum development from initial planning stage to final product.

of the three areas of Vocations, Daily Living Skills, and Leisure Time Activities. After students become aware of career options related to the three areas, they are led through science activities that stress the relationship between science, problem-solving, and life experiences. The students analyze each scene in a series of slides to assess the ways that scientific information might be necessary or useful. In each exercise, based on content from a different cluster, an extensive line of questioning is presented to provide a model of inductive questioning. The Inquiry Skill exercises are used to guide the students to an understanding of the inquiry skills and problem-solving steps they will be using throughout the program. Each student must learn to understand and apply systematically both the inquiry skills and the lab skills in order to master the science content and problem-solving techniques. The student handbook is designed for the student to use as part of the information-gathering process about individual aspects of ME IN THE FUTURE. Designed to be used individually, or in large or small groups, it

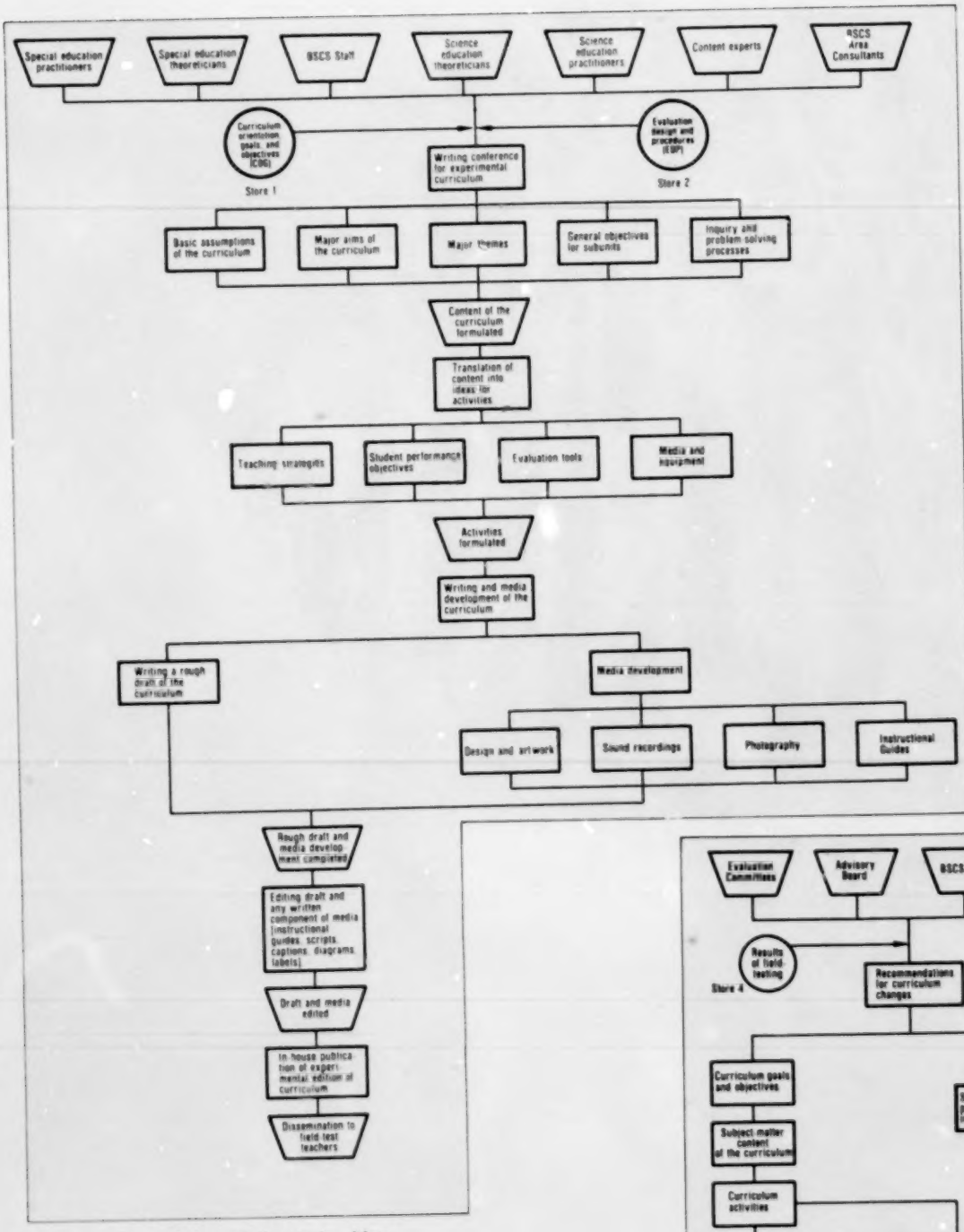

Special education practitioners
Special education theoreticians
BSCS Staff
Science education theoreticians
Science education practitioners
Content experts
BSCS Area Consultants
Curriculum orientation goals and objectives (COG)
Store 1
Writing conference for experimental curriculum
Evaluation design and procedures (EDP)
Store 2
Basic assumptions of the curriculum
Major aims of the curriculum
Major themes
General objectives for subunits
Inquiry and problem solving processes
Content of the curriculum formulated
Translation of content into ideas for activities
Teaching strategies
Student performance objectives
Evaluation tools
Media and equipment
Activities formulated
Writing and media development of the curriculum
Writing a rough draft of the curriculum
Media development
Design and artwork
Sound recordings
Photography
Instructional Guides
Rough draft and media development completed
Editing draft and any written component of media (instructional guides, scripts, captions, diagrams, labels)
Draft and media edited
In-house publication of experimental edition of curriculum
Dissemination to field test teachers

Figure 5. Stage 3, formulating and writing the experimental curriculum.

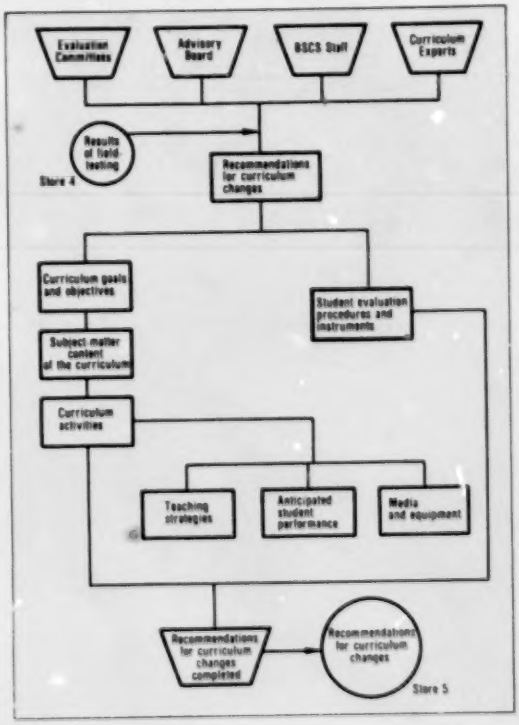


Figure 6. Stage 7, compilation of recommended curriculum changes.

should serve as a constant reference for the student regarding all aspects of the program. The extensive variations in activities within ME IN THE FUTURE require a variety of information so that the student can best benefit from individual activities. The handbook is designed to familiarize the student with those aspects and maximize the possibility for the student to benefit from the program. The Metrics cluster is also designed to be presented as part of the Introductory Program. Presented as a whole class activity, with considerable teacher direction, the cluster serves as a model to teach management of materials to the students.

The Interest Inventory is an instrument designed to assist the teacher in ascertaining the career interests of the students as related to the Leisure Time area, Vocation area, and the Daily Living Skills area of the program. Such information will help the teacher guide the student's initial entrance into the various clusters and manage the work use of the ME IN THE FUTURE clusters and activities.

The Interest Inventory has been modified to include specific references to the actual content contained in the various clusters, rather than general references to the career areas. A summary of the component parts of the Introductory Program, along with a description of each, is presented in Table 5. In addition to the modifications in the Introductory Program, cluster-level, problem-solving activities have also been added at the end of each cluster to give the students practice in applying the inquiry skills and problem-solving techniques to career-related problems that focus on the science content presented in each of the clusters.

PROJECTIONS FOR FIELD TEST II

The revised program is currently undergoing a second field test during the 1977-78 school year. In addition to the eleven test sites used in the first field test, five new sites have been added in order to obtain a broader socioeconomic and geographical representation in the field-test population. The location of these sixteen sites is shown in Figure 8.

The second field-testing of ME IN THE FUTURE will focus more on the evaluation of the development of inquiry skills and problem-solving behaviors within the clusters, and the success of the program's integration of the process skills and content of science with career education. Various instruments will also be used to assess the affective dimension of the program. Following is a list of evaluation concerns that the staff has identified for the second field test, along with a brief description of the approach that will be taken in investigating each.

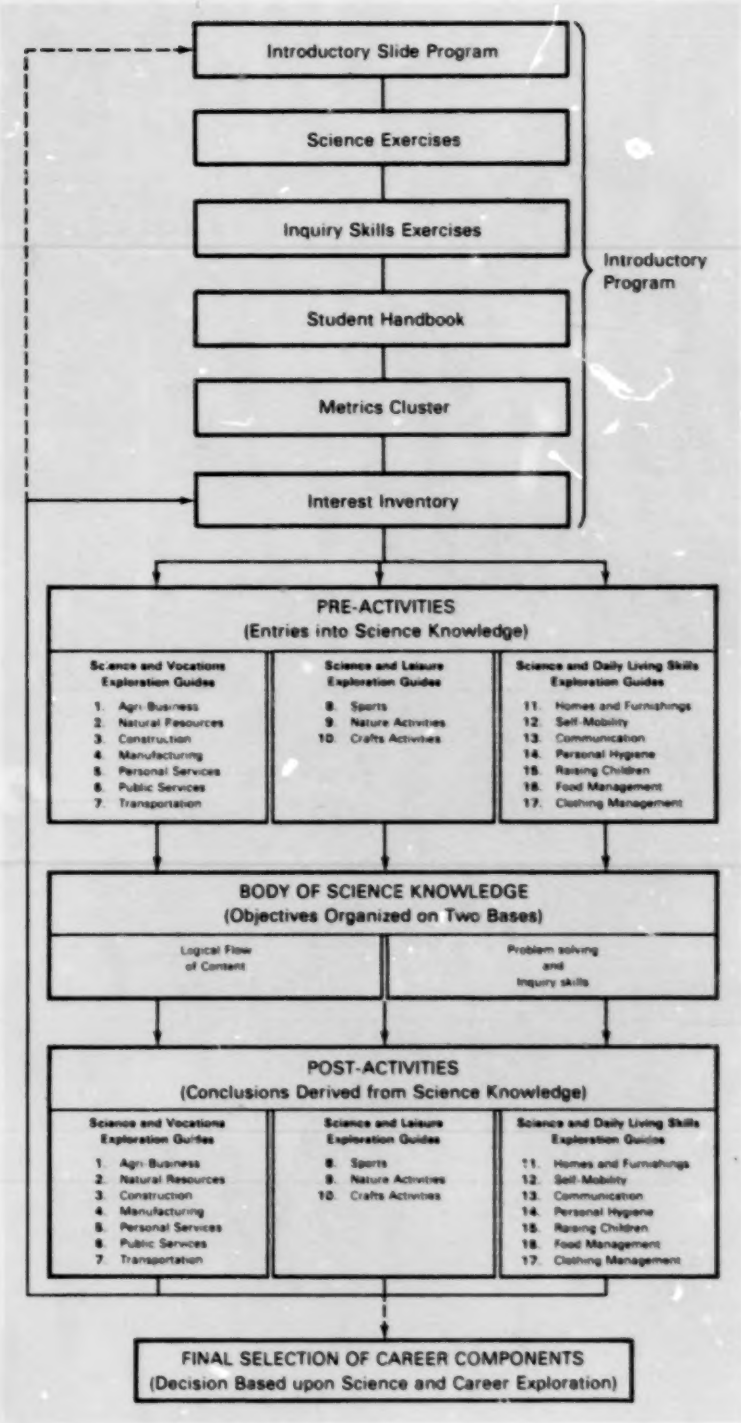


Figure 7. Revised conceptual flow of ME IN THE FUTURE second experimental edition 1977-78.

1. The Development of Inquiry Skills in Students

The Development of Inquiry Skills in Children (DISC) was developed by the staff to assess the level to which a student has attained inquiry skills. The evaluation is conducted using a structured interview in which students are shown a stimulus picture and asked a question concerning the picture. Each stimulus picture is paired with a question and two prompts. The student is scored according to the appropriateness and logic of response and the number of prompts required. The evaluation includes three tracks of stimuli, varying in complexity, that assess separately the student's ability to observe, describe, identify, compare, associate, infer, apply, and predict.

2. Student Awareness of Career Possibilities

The staff felt that career awareness seemed more aligned with content than affect. Therefore, the student's awareness of careers and career opportunities will be assessed through the content evaluation. As the program is currently structured, it seems reasonable to expect that most of the students will not complete each cluster. Therefore, the career awareness evaluation will be accomplished through the use of keyed items of the cluster-level pretests and posttests. Thus, the student's awareness level will be assessed within the confines of his or her exposure to the program. The items will measure the student's understanding of the purpose and nature of the career area, as well as the kind of duties, activities, and work environments that are representative of the area.

3. Locus of Control in Students

A cartoon version of the Nowicki-Strickland Locus of Control Scale has been selected to assess the construct of locus of control or reinforcement in students. Both a pretest and a posttest will be administered to determine if students sense a better control over their own destinies after completing the ME IN THE FUTURE program. This instrument was developed along a definition of locus of control as the perception of a connection between one's action and its consequences. The items describe reinforcement situations across interpersonal and motivational areas such as affiliation, achievement, and dependency. The scale consists of a paper and pencil test of 22 items presented in a cartoon type of format with different forms for males and females. This shorter, but reliable, revised version of the original 40-item scale used the 21 items which discriminate the best for students in the

Table 5. Summary of component parts of introductory program.

Program Component	Teaching Methods	Purposes	Student Activity	Time
(1) Slide Program "A Man and His Motorcycle"	(1) Show the introduction slides.	Generate interest and motivation.	Watch slides.	1 class
	(2) Show the slides a second time.	Identify 3 areas of program: Vocation, Daily Living Skills, Leisure Time.	Watch slides; group slides according to the 3 major areas.	2 classes
	(3) Show slides a third time.	Identify clusters.	Watch slides; group slides into clusters.	2 classes
(2) Science Exercises	Class discussion based on six selected slides from "A Man and His Motorcycle" (two each from Vocation, Leisure Time, and Daily Living Skills areas).	Introduce the relationship of science skills to life.	Watch slides; identify action of slide; associate action of slide with science content.	3 classes
(3) Inquiry Skill Exercises	Demonstrate (1) lime wash exercise and (2) motorcycle assembly exercise.	Introduce inquiry skills.	Interact orally as a group with the teacher to identify inquiry skills.	3-5 classes
(4) Student Handbook	Read and review each section of the booklet with the students.	(1) Introduce each part of the program. (2) Show how to use the student handbook as a reference. For definitions of clusters, inquiry skills, problem-solving behaviors, safety in the lab, parts of the program.	Read and discuss the booklet.	2-3 classes
(5) Metrics Cluster	This cluster should be completed with the whole class working as a group under the guidance and direction of the teacher.	(1) Use as a model to practice the use of the format of the program. (2) Learn some parts of precision in measurements, and how to use measuring tools.	Work through the activities with the teacher.	10-12 classes
(6) Science Interest Inventory	Use Science Interest Inventory with students.	Students will select 3 clusters according to their greatest interest.	Complete the Science Interest Inventory.	1 class

1. **Brian O'Donnell**
   East Valley High School
   Spokane, Washington
2. **Clyde Bhatt**
   North Hollywood High School
   North Hollywood, California
3. **Joe Shirey**
   Fairview High School
   Boulder, Colorado
4. **Geraldine Frost**
   Career Enrichment Park
   Westminster, Colorado
5. **Janet Atchison**
   Kunsmiller Jr. High School
   Denver, Colorado
6. **David Garcia**
   West Las Vegas High School
   Las Vegas, New Mexico
7. **Floyd Ploeger**
   William B. Travis High School
   Austin, Texas
8. **Carol Tiller**
   Abraham Lincoln High School
   Council Bluffs, Iowa
9. **Minnie Jefferson**
   McKinley Southwest Special Education Center
   Chicago, Illinois
10. **Leslie Robson**
    Palmetto High School
    Palmetto, Georgia
11. **Donna Jahnke**
    Mary Ellen May
    Osceola High School
    Kissimmee, Florida
12. **Connie L. Cochran**
    Albemarle High School
    Charlottesville, Virginia
13. **Geralynn Wright**
    Western Albemarle High School
    Crozet, Virginia
14. **Sandra Comer**
    Maury High School
    Norfolk, Virginia
15. **Bonnie Kovalcik**
    Park Ridge High School
    Park Ridge, New Jersey

Figure 8. ME IN THE FUTURE field-test sites 1977-78.

seventh through the twelfth grades. The items are readable at the fifth-grade level yet appropriate for older students. If necessary the scale can be read orally by the teacher in a group-testing situation.

4. Student Attitudes Towards Program

The Student Attitude Survey (SAS) was developed by the staff to measure student reactions to the overall program and its component parts. The SAS, which can be administered in groups or individually, is a 25-item, self-report survey using a four-choice Likert-type scale. The SAS has three sections. Questions 1 through 8 assess the student's attitude toward the construction and design elements of the program. Questions 9 through 17 assess the interest/affective aspects of the program. Questions 18 through 25 assess the student's attitude toward skills obtained by using ME IN THE FUTURE.

A variety of student background data has also been collected to investigate the possible relationship between general characteristics and abilities of the target population and success with the program. Those variables that appear to have significant influence will be identified and included in later statistical analyses. The long-term effects of ME IN THE FUTURE are also a vital concern. Additional input from the ME IN THE FUTURE Evaluation and Advisory Committees will be sought in planning this dimension of the evaluation process.

SUMMARY

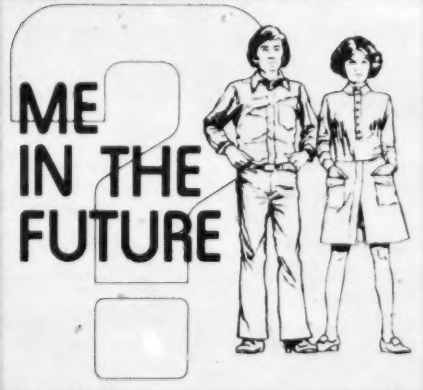
In summary, development and evaluation of ME IN THE FUTURE reflects a positive response to the materials and activities considered. The evaluation items, teacher feedback, and reviewers' comments indicate a general acceptance of the materials. Although several modifications in the curriculum have been recommended, the body of knowledge was presented in a manner that was accepted by the teachers as accurate, as well as valuable to the student.

The students evaluated in the context were, in all but isolated instances, able to achieve the objectives set forth at an acceptable level. In the instances where the level of performance was not acceptable, the reason was usually a flaw in the construction of a test item or in the presentation of the content. Based on the analyses of student performance, recommendations were provided to the summer writers for a needed revision of individual activities. Additionally, the existing introductory section of the program was modified, new clusters and activities developed, and cluster worksheets and tests revised. Those modifications in the existing program, along with evaluation of the affective dimension of the program, will be the primary focus of evaluation efforts in the second field test. Additionally, data will be gathered to determine the extent to which the students are able to function at the different levels of inquiry at which the science content is presented.

Following the second field test, a final revision will be undertaken during the summer of 1978, after which the program will be turned over to a commercial publisher for release sometime after the summer of 1979.

The essential characteristics of the development and evaluation processes are clearly demonstrated by the activities in curriculum development reported here. The systematic gathering of data for the purpose of improving ongoing activity and modifying curriculum content is shown to be a key element in curriculum development. Perhaps the key element in the entire formative evaluation process is a system for collecting feedback and translating it into recommendations for modifying materials. With stable goals and objectives delineated, the ongoing modification of curricula is accomplished through a feedback system of field testing, student assessment, and the implementation of expert opinion on content and relevance.

THE FUTURE OF ME IN THE FUTURE



This newsletter has presented an update on ME IN THE FUTURE. It has shown in various forms the history, development, and evaluation of an ongoing project within the Biological Sciences Curriculum Study. The progress of the project has relied on patterns of curriculum development that lead to the commercial release of needed aids to the teacher. Continued progress is anticipated, and culmination of the project should result in the anticipated commercial release. The staff now looks forward to the last year of ME IN THE FUTURE as a time when all the final revisions of activities, evaluation instruments, materials kits, and implementation strategies will be accomplished; and a year when ongoing communications with the publisher will be increased to a point where the developers can be assured of a speedy and efficient delivery of the first edition of ME IN THE FUTURE to the schools and students who need it so urgently.

During this final year, the revised activities will be checked for release, media will be modified to allow for improvement to a professional level, copy will be analyzed for reading level and ease of presentation, and component parts will be modularized for ease of implementation.

The entire project will be streamlined in an effort to reduce the potential costs of the first edition so that it will be financially within the grasp of its large potential market. Modulization of the program will be accomplished in an effort to allow individual clusters to be purchased; and a careful analysis of the pre- and posttests as well as the objective statements will assure compliance with the requirements of P.L. 94-142.

It is the sincere hope of the ME IN THE FUTURE staff that the autumn of 1979 will bring the wide dissemination of a product capable of providing a long-needed addition to the teacher's repertoire of highly functional instructional materials.

The Materials Kit

Many of the special education classrooms that will use ME IN THE FUTURE will not be equipped to handle science activities. Thus, the ME IN THE FUTURE package must include the hardware necessary to operate the program successfully. A materials kit containing necessary pieces of equipment is being developed, and is being tested along with the printed materials.

The materials kit is designed in modular form, with each cluster grouped in a set of drawers. Common materials such as chemicals or glassware are grouped in a set of "Commons" drawers that allow easy access for students and teachers. The goal of the materials kit development is to provide all the beakers, test tubes, hardware, and uncommon lab materials to a teacher in a form that is both inexpensive and easy to use.

The use of the kit has been simplified, and the students are taught how to access the materials before they begin independent cluster study. The following discussion is taken from the student handbook, and illustrates how the students are taught to be independent in their classroom use of ME IN THE FUTURE.

HOW DO I USE THE KIT?

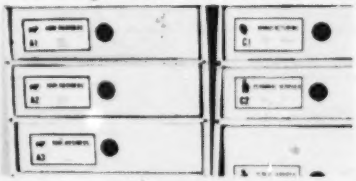
You will be using many different things when you do the activities of ME IN THE FUTURE. Some of the materials are already available in your school or classroom. Paper, pencils, and rulers are examples of such materials. There will be times when your teacher will bring special materials to school for you to use. Most of what you will be using is in the kit of drawers you have in your room. Those drawers have most of what you need for each activity.

As you do an activity you will come to the **Get Ready** part. That part tells you what you need for the activity. It also tells you where to get the things you need.

If the **Get Ready** part of the activity tells you to go to the kit, you must go to the set of boxes in your room.

1. Look at the number and title of the activity you are working on.
2. Find the name of the cluster you are working on. The drawers are arranged by clusters.
3. Now look for the drawers with the name of the cluster you are working on. For example, if you are working on the Agri-Business cluster, Activity 2, "pH in the Soil," you must first find all the Agri-Business drawers.

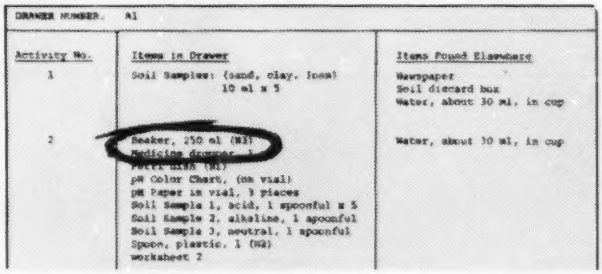
Look at this picture. Find the Agri-Business drawers in this picture.



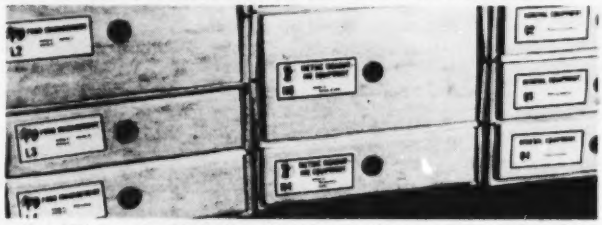
4. Now you must find the drawer with the number of the activity you are working on. Look at the picture. You can see the arrow pointing to the activity number. This is the drawer that has most of the things you need for this activity.

5. Check the **Get Ready** part of the activity you are doing. See what you need for the activity. Take what you need from the drawer. Bring it to your work area.
6. The drawer may not have all you need. If not, then look at the list on the inside of the drawer. The list has "Items Not in This Drawer."
7. Look at the list. Next to each object on the list is a number. This number tells you what drawer that article is in. You must now find that drawer and get the article from it. For example, look at the picture. It shows you the list from the drawer for the activity.

Look at what is circled. The "N3" tells you that you must go to the drawer labeled "N3" to find the beaker.



8. Find the drawer labeled "N3." Look at this picture. It shows you where these labels are on the drawers.



9. When you find the right label then you can take what you need from that drawer.
10. Look at the list again in the drawer you started with. Look at the next article you need on the list. Find what drawer it is in. Get that object from its drawer.
11. Your book will tell you if your teacher has any equipment you need. If the teacher has it, be sure to ask for it.
12. You must do this for each article in your activity that is in the kit. When you have all the materials you need then bring them to your work area and start the activity.
13. If you have any problems finding what you need in the kit, please ask your teacher for help.

When you finish an activity, be sure to clean any equipment that needs it and then return all the materials to the kit or to your teacher.

To return the materials to the kit, do as follows:

1. Go back to the drawer with the name of the cluster and activity number that you are doing.
2. Return the articles to that drawer that belong there.
3. Look at the list in the bottom of the drawer. Find out from that list where each article belongs. Remember that after the name of each article is the **number** of the drawer it goes in. Find that drawer. Put the articles back that belong in that drawer.
4. If you cannot find the correct drawer for any article, then ask your teacher for help.

Sample activities from
ME IN THE FUTURE

On this and the following nine pages are reproduced at about half size two different types of activities. "Talk Is Cheap" is one of the later activities from the Personal Hygiene cluster. In this activity the students learn what questions to ask a doctor during a visit to the doctor's office. The Problem-Solving Activity is the final activity from the Food Management cluster. The students apply the knowledge and skills they have learned to solving a problem that may confront them during normal everyday activities. These activities are part of the second experimental edition that is being tested in fifteen schools across the country.

pre-activity

PERSONAL HYGIENE
Activity 12

Talk Is Cheap

Focus: *Listen to an example of how* **not** *to talk to your doctor.*

USE THE CASSETTE FOR THIS ACTIVITY

In the last activity you learned that if you have pain and high temperature you are probably sick. Once you know you're sick, part of good personal hygiene is to see a doctor if you need to. Going to a doctor may seem like an easy thing to do. But, if you don't know what to tell the doctor or what to ask, seeing the doctor may not help you much.

If you don't understand what the doctor tells you and you don't ask questions, you could harm yourself.

Let's see what could happen if you don't know what to say to your doctor. Listen to what happened to Mrs. Tarp.

91

Narrator: Day 1, 2 p.m. Mrs. Tarp is just finishing with her doctor's appointment. Let's listen in.

Dr. Callahan: You'll be just fine, Mrs. Tarp. Get this prescription filled at Bishop's Drug Store. Make an appointment with the nurse. I want to see you next week.

Mrs. Tarp: Oh, thank you, Dr. Callahan.

Narrator: Day 2, 10 a.m. Mrs. Tarp has just called her doctor on the phone.

Mrs. Tarp: (on phone) Sorry to bother you, Dr. Callahan, but the blue pills you gave me, do I take them before I eat or after I eat?

Dr. Callahan: You should take them before you eat. They will help calm your stomach.

Mrs. Tarp: Oh, thank you, Dr. Callahan.

Narrator: It is now 3 p.m. of the same day. Mrs. Tarp is calling the drugstore.

Mrs. Tarp: Is this Bishop's Drug Store? I got some blue pills from you. The number on the bottle is 555-6558. My eyes are blurring a lot. I was wondering if the pills would make my eyes do that.

Druggist Bishop: Yes, they could cause your eyes to blur.

Mrs. Tarp: Should I stop taking them?

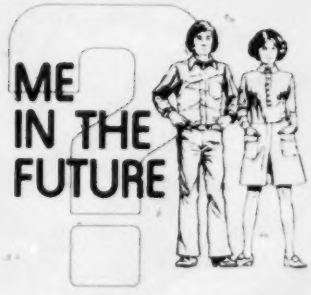
Druggist Bishop: I don't know. You'll have to ask Dr. Callahan.

Mrs. Tarp: But he's sooo busy. And I've already called him once.

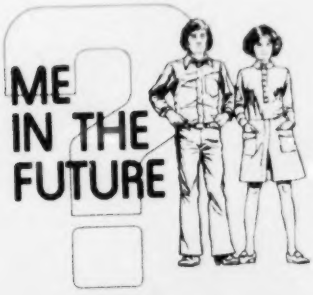
Druggist Bishop: Well, I think you should call him anyway.

Narrator: Day 3, 9:30 a.m. Mrs. Tarp is calling the doctor. (sound of phone ringing)

92



SAMPLE ACTIVITIES



activity

PERSONAL HYGIENE
Activity 12

Focus: *Do you know how to talk to your doctor? Listen to the tape for the best way to talk to your doctor.*

USE THE CASSETTE FOR THIS ACTIVITY

Knowing how to talk to your doctor means a lot in getting the right treatment.

A lot of people seem to think doctors **know** what you are thinking. Doctors get busy and may forget to tell you things, just like anyone else. The doctor has no way of knowing what you heard when he talked to you. He may not know what you are worried about, or what you know about the medicine he may give you. If the doctor gives you medicine, you should know how much to take. If you don't, it could be harmful to you.

You should know what questions to ask the doctor. If you ask the right questions, the doctor will know what to tell you. That will help **you know** exactly what the doctor wants you to do. Then you will get the most out of your visit to the doctor.

Let's look at some questions you could ask the doctor. These questions will help you and the doctor understand each other.

When you go to the doctor, you should:

1. Tell him if you have a fever.
2. Tell him if you have any pain.
3. Tell him about anything else that is not normal for your body. That includes such things as diarrhea, a lump under the skin, vomiting, if you are unable to sleep, or dizziness.

Nurse Tolman: Hello, Dr. Callahan's office. Nurse Tolman speaking. May I help you?

Mrs. Tarp: This is Mrs. Tarp. Dr. Callahan prescribed some blue pills for me that are making my eyes blur. My mouth feels like it is full of cotton. Should I stop taking the pills?

Nurse Tolman: Could you hold the line please? I will ask the doctor. I'm sorry it took so long. The doctor was with a patient. He said to take the pills only at lunch time.

Narrator: You have just listened to a bad way to talk to your doctor. If Mrs. Tarp had asked the doctor some simple questions before she left the office, she could have saved herself a lot of time, trouble, and fear.

Because Mrs. Tarp wouldn't ask her doctor some simple questions, she caused herself a lot of problems.

Practicing good personal hygiene and keeping a healthy body include taking the right questions when you see the doctor.

In short, knowing how to talk to your doctor is important to your health.

Go on to the activity to learn how to talk to your doctor.

Go on to the ACTIVITY

SAMPLE ACTIVITIES

When the doctor has finished looking you over, you should ask him these questions:

1. What is wrong with me?
2. Why did I get it? (You may have eaten something, or had a friend who had the disease.)
3. How can I keep from getting it again? (Maybe a change in diet, vitamins, or wearing warmer clothes would help.)
4. Are there any medicines for me to take?
5. If there are medicines:
   a. How often should I take them?
   b. When should I take them?
   c. How much should I take?
   d. Will there be any bad effects from taking the medicine (dizzy, sick to stomach, blurred sight)?

Taking medicine can be harmful if you do not know exactly how you should use it. For example, if medicine makes you dizzy or sleepy, it would be dangerous for you to drive. Some medicine should never be taken along with alcohol, or you could even die.

That is why it is **most** important to understand how to take your medicine.

6. Should I come back for another visit? (Sometimes a sickness lasts a long time. If it does, the doctor should see you again to make sure you are getting better.)
7. Is there anything special I should do at home, such as:
   a. Stay in bed?
   b. Stay warm?
   c. Drink lots of water?
   (Knowing how to treat your body while it is sick will help you get well faster.)

Now you know some questions that you should ask the doctor. Don't be afraid to ask a question again if you don't understand. Doctors want to be sure you follow directions. They will be happy to explain something you don't understand.

95

Let's go back and see what happens when Mrs. Tarp asks the doctor the right questions.

GET READY

Get Worksheet 12 A from the kit.

GO

Narrator: Day 1, 2 p.m. Mrs. Tarp is just finishing with her doctor's appointment. Let's listen in.

Mrs. Tarp: What is wrong with me?

Dr. Callahan: Mrs. Tarp, you have an infection in your stomach.

Mrs. Tarp: How did I get it?

Dr. Callahan: People usually get it from using dirty dishes or silverware.

Mrs. Tarp: How can I keep from getting it again?

Dr. Callahan: Be sure to wash all your dishes carefully with soap and hot water. Rinse them afterwards with hot water.

Mrs. Tarp: Are there any medicines for me to take and how should I take them?

Dr. Callahan: Yes there are. Get this prescription filled at the drugstore. You should take the medicine before you eat. That will help settle your stomach.

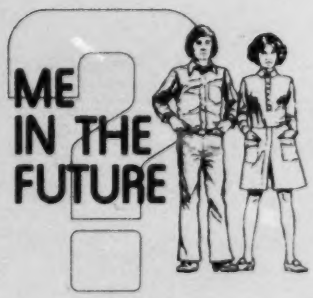
Mrs. Tarp: Are there any bad effects from taking the medicine?

Dr. Callahan: Yes, you may feel dizzy and your mouth may feel dry. If that happens call me.

Mrs. Tarp: Should I come back for another visit?

Dr. Callahan: Yes, make an appointment with the nurse. I want to see you next week. If you have any problems, call me right away.

96



Mrs. Tarp: Do I need to do anything at home?
Dr. Callahan: No, the medicine should take care of everything.
Mrs. Tarp: Thank you, Dr. Callahan. I'll call you if I have any problems.
Narrator: Mrs. Tarp probably won't need to call the doctor again. She asked all the right questions and found out what she needed to know **before** she left the office.

Mrs. Tarp saved herself a lot of time, worry, and trouble by asking the doctor the right questions. She got all the information she needed to get well again.

Now you know how to get the most out of your visit to the doctor.

WORKSHEET

Now answer Questions 1 through 3 on Worksheet 12 A. By answering those questions you will be figuring out what **might** happen from what you already know. You will also use what you have learned in a new situation and say what would **probably** happen from what you already know.

Along with this activity you should get a question sheet (Worksheet 12 B) of your own. It has all the questions you should ask your doctor on it. Keep it in your purse or wallet. Use it whenever you visit a doctor's office. If you didn't get one, ask your teacher for one.

Go on to the POST ACTIVITY

post-activity

PERSONAL HYGIENE
Activity 12

Focus: *You will review the importance of knowing how to talk to your doctor.*

Now you know the importance of talking to your doctor. You also know what things to say.

Being sick is no fun. Getting help from a doctor is important. To get the most out of your visit to the doctor, you need to understand his or her directions. To do this you must ask the right questions.

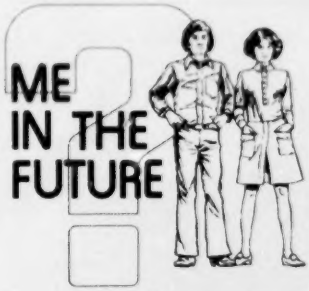
To keep your body healthy, and practice good personal hygiene, you need to know how to talk to your doctor when you are sick.

In this cluster you have learned how to take care of your body. You have seen how **good** personal hygiene helps you in knowing how to:

1. take care of your hair, skin, and teeth.
2. take care of certain diseases (parasites, sexually transmitted diseases).
3. make a decision about drugs, alcohol, and tobacco.
4. take care of feminine problems related to feminine hygiene.
5. take care of unexpected accidents that could be harmful to the body.
6. listen to your body when it tells you it is sick and what to say to a doctor.

Knowing all these things about personal hygiene is **very** important. Practicing good personal hygiene by doing these things will help you to have a happier, healthier body.

CHECKLIST
— 1. Clean up your area.
— 2. Put your materials away.
— 3. Hand in worksheets to your teacher.



activity

FOOD MANAGEMENT
Activity 12

Problem-Solving Activity

You have finished the Food Management cluster. In the Food Management activities you learned about food. You learned how to take care of food. You learned how to choose the best foods.

You found out that food management means changing foods. You made egg drop soup. You found out how cooking foods changes them.

You learned that seasonings change food. You added seasonings to rice. You changed the way the rice tasted, smelled, and looked.

You learned about preserving foods. Preserving means canning, freezing, dehydrating, and refrigerating. You dehydrated meat and fruit. You found that dehydrated foods last longer. Preserved foods are safe to eat longer.

You found other ways to keep foods safe. A good cook can protect the people who eat the food. Washing, covering, and cleaning help make food safe.

Not only people eat food. You found that foods must be protected from insects. Flies and other insects can make food unsafe to eat.

Food management means knowing how to take care of food. A good cook knows how to keep food safe. A good cook knows about washing, covering, and cleaning foods. A good food manager knows how to preserve food and protect food from insects.

Food management means knowing how to make food taste, smell, and look good. A good cook knows about seasoning and cooking food.

Food management means knowing how to choose the best foods. You learned that foods can be

93

divided into four basic food groups. What you eat helps make you healthy. Your body gets vitamins and minerals from the foods you eat. Without the right vitamins and minerals your body won't be healthy.

You found that there are ways to pick the right foods.

You learned the rules for choosing the right foods. Pick the right number of foods from each food group. You learned that every day you should eat

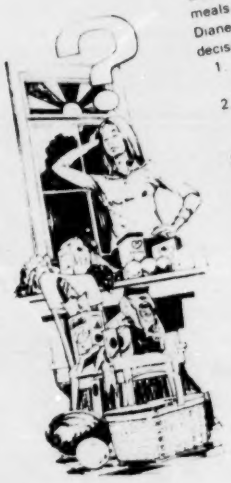
4 breads and cereals
4 fruits and vegetables
2 dairy products
2 meat and meat substitutes

You found that you need to pick different foods from each food group. Picking different foods will help your body get vitamins and minerals.

Food management means knowing how to choose foods. Food management means healthful eating.

94

SAMPLE ACTIVITIES



CAN YOU SOLVE THIS?

Diane's family is planning a trip to the mountains this weekend. They will leave after breakfast. They will not return until after dark. The family will have to plan for two meals on the trip. At noon they will stop at a roadside picnic table for lunch. In the evening they will stop near a lake to have the big meal of the day. Then they will drive home.

Diane's mother will not have time to plan the meals for that day. She has asked Diane to do it. Diane has to consider the following in making her decisions about what menu to plan.

1. The day's food must be a balanced menu with something to eat from all four food groups.
2. All the food must be cooked before leaving on the trip. No fires will be allowed in the mountains.
3. The drive will be long and hot. The food will be stored in an ice chest during the trip.
4. There will be six people on the trip: Diane, her three younger brothers, and her mother and father.

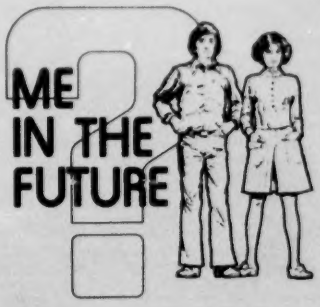
HERE'S HOW TO SOLVE IT

In this activity you are given a problem to solve. You must follow certain steps to solve it. There are many other ways to solve problems. But these six steps will give you one good way.

The steps are:

1. Find the problem.
2. Think of possible solutions.
3. Choose a solution.
4. Test your solution and record your results.
5. Review results and make conclusions.
6. Receive reactions to your solution.

95



Later on, you will learn how to solve problems on your own. You will learn how to ask questions that make things clearer. You may also experiment and collect information to get answers to your problems. Then you can compare answers and use your thinking power and inquiry skills to decide which is correct. By following the six steps, you will be able to solve the problem in this activity. You will also be able to solve many of your other problems.

Science is asking questions and finding out answers. It is asking for proof. It is working with facts. Science is a way to solve many of your everyday problems.

What would you do?

It is important to see if a problem exists. So the first problem-solving step is to decide what the problem is. What are the parts of the problem?

STEP 1: FIND THE PROBLEM

Diane's problem is to plan two meals for a family picnic.

A. What are the parts of the problem?
1. What are the four food groups?
2. How many people are eating?
3. What food must be kept cold?
4. What food must be cooked ahead of time?

STEP 2: THINK OF POSSIBLE SOLUTIONS

After identifying the problem and its parts, move to the second step. You should observe and describe all the facts that are important to each part of the problem. Then organize all the information you know about the problem. Use that information to think about all the ways you might solve the problem. When you think about all the possible solutions, you are "brainstorming" to try to figure out ideas or answers to the problem.

96

Diane asked her three brothers to give her a list of the food each likes to eat. From those lists, she made up three possible menus. Here they are:

Menu 1:

Breakfast:	Cold cereal Orange juice Toast and jelly Milk Bananas
Lunch:	Cold meat and cheese sandwiches Fruit punch Apples Carrot sticks
Supper:	Tuna and macaroni casserole Garden salad Cheese Rolls, butter, honey Watermelon Peaches Fruit punch

Menu 2:

Breakfast:	Eggs Bacon Milk Coffee
Lunch:	Soda pop Potato chips Cold pizza Candy bars
Supper:	Hamburgers Corn chips Cola Ice cream

Menu 3:

Breakfast:	Coffee Donuts
Lunch:	Watermelon Soda pop Hot dogs Pretzels

97

Supper

Steak
Potato salad
Celery
Lemonade

STEP 3: CHOOSE A SOLUTION

The third step is to pick the most likely solution. Look over all the possible advantages and disadvantages to each solution. Remember all parts of the problem and pick the best answer based upon the information you have gathered.

Which solution or menu will be the best for Diane to plan for the outing?

Solution 1—Menu 1
Solution 2—Menu 2
Solution 3—Menu 3

If you choose:

Solution 1—Go to Page 99
Solution 2—Go to Page 101
Solution 3—Go to Page 103

98

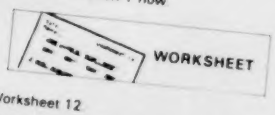
You picked Solution 1.

If Diane picked Solution 1 she would make the following meals for the picnic:

Breakfast:	Cold cereal Orange juice Toast and jelly Milk Bananas
Lunch:	Cold meat and cheese sandwiches Fruit punch Apples Carrot sticks
Supper:	Tuna and macaroni casserole Garden salad Cheese Rolls, butter, honey Watermelon Peaches Fruit punch

STEP 4: TEST YOUR SOLUTION AND RECORD YOUR RESULTS.

You can test Solution 1 now.



Do Worksheet 12.

STEP 5: REVIEW RESULTS AND MAKE CONCLUSIONS.

All the questions on the worksheet are things Diane should think about when she plans a picnic menu. If you answered yes on all the questions, then Solution 1 is a good menu. If you answered no on **any** of the questions, then Solution 1 is not a good menu.

Look at your answers on the worksheet. What is your conclusion? Is this the best menu?

99

STEP 6: RECEIVE REACTIONS TO YOUR SOLUTION

Diane would receive a reaction to Solution 1 if she made the food on Menu 1 on the day of the picnic. Menu 1 has a good variety of foods on it. Everyone in her family would enjoy them. All the food would stay cold in the ice chest. Nothing would have to be cooked. Menu 1 includes food from all four food groups. This is a good menu.

You have followed the problem-solving steps to help Diane solve her problem. Go to Page 105 to review how you solved the problem.

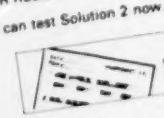
You picked Solution 2.

If Diane picked Solution 2 she would make the following meals for the picnic.

Breakfast:	Eggs Bacon Milk Coffee
Lunch:	Soda pop Potato chips Cold pizza Candy bars
Supper:	Hamburgers Corn chips Cola Ice cream

STEP 4: TEST YOUR SOLUTION AND RECORD YOUR RESULTS

You can test Solution 2 now.



WORKSHEET

Do Worksheet 12.

STEP 5: REVIEW RESULTS AND MAKE CONCLUSIONS

All the questions on the worksheet are things Diane should think about when she plans a picnic menu. If you answered yes on all the questions, then Solution 2 is a good menu. If you answered no on **any** of the questions, then Solution 2 is not a good menu.

Look at your answers on the worksheet. What is your conclusion? Is this the best menu?

STEP 6: RECEIVE REACTIONS TO YOUR SOLUTION

Diane would receive a reaction to Solution 2 if she made the food on Menu 2 on the day of the picnic.

Hamburger has to be cooked. No fires can be made at the picnic site. Everyone would be disappointed. They could not eat raw hamburger. The ice cream would melt, even in an ice chest. Everyone would get mad at Diane.

This is not the correct choice.

Go back to Step 3 on Page 98 and choose another solution.

102

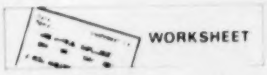
You picked Solution 3.

If Diane picked Solution 3 she would make the following meals for the picnic.

Breakfast:	Coffee
	Donuts
Lunch:	Watermelon
	Soda pop
	Hot dogs
	Pretzels
Supper:	Steak
	Potato salad
	Celery
	Lemonade

STEP 4: TEST YOUR SOLUTION AND RECORD YOUR RESULTS.

You can test Solution 3 now.



Do Worksheet 12.

STEP 5: REVIEW RESULTS AND MAKE CONCLUSIONS.

All the questions on the worksheet are things Diane should think about when she plans a picnic menu. If you answered yes on all the questions, then Solution 3 is a good menu. If you answered no on **any** of the questions, then Solution 3 is not a good menu.

Look at your answers on the worksheet. What is your conclusion? Is this the best menu?

STEP 6: RECEIVE REACTIONS TO YOUR SOLUTION.

Diane would receive a reaction to Solution 3 if she made the food on Menu 3 on the day of the picnic.

103

No fires can be made at the picnic. Steak must be cooked. Everyone would be disappointed that they could not have steak for supper. The food on this menu would not appeal to all ages. It does not include food from all four groups. This is not the correct solution.

Go back to Step 3 on Page 98 and choose another solution.

104

HOW DID YOU SOLVE THIS PROBLEM?

Let's review the following six steps in solving Diane's problem.

STEP 1: FIND THE PROBLEM.

The first step is always to decide what the problem is. Diane's problem was to plan meals for her family for a picnic. She had to make a balanced diet including food from the four food groups.

STEP 2: THINK OF POSSIBLE SOLUTIONS.

Try to think of as many possible solutions as you can. Think of the advantages and disadvantages of each solution. Diane had three solutions to choose from. She made three menus from the lists of favorite foods her brothers gave her.

STEP 3: CHOOSE A SOLUTION.

Look over all the possible solutions and select the best one. The best one to help Diane solve her problem was Solution 1, or Menu 1.

STEP 4: TEST YOUR SOLUTION AND RECORD YOUR RESULTS.

You tested Solution 1 when you answered the questions on Worksheet 12.

STEP 5: REVIEW RESULTS AND MAKE CONCLUSIONS.

You reviewed the results of the worksheet. You answered yes to all four questions. This meant that Menu 1 was a good menu for a picnic.

STEP 6: RECEIVE REACTIONS TO YOUR SOLUTION.

You received a reaction to your solution when Diane took the food on Menu 1 on the picnic. Everyone got a good balanced diet that day. They all enjoyed the food. Diane was glad.

105

Knowing how to plan meals correctly makes a difference. It helps you enjoy your food more. It helps keep you healthy. Someday you might have to plan a meal for some people. You will be glad you have learned how to do it.

106